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REMOTE SERVICE AGENT FOR SENDING COMMANDS  
AND RECEIVING DATA OVER E-MAIL NETWORK

CROSS REFERENCE TO RELATED APPLICATIONS

This application claims the benefit and priority of U.S. Provisional Application,  
5 Serial No.60/251,340 filed December 5, 2000 and fully incorporated herein by  
reference.

FIELD OF THE INVENTION

The invention relates to a communication system that allows customer to  
easily access various types of corporate and public data securely through any  
10 electronic mobile communication device. Particularly, the invention relates to a  
communication system in which a service agent computer receiving customer  
commands from a user is capable of executing native host commands or applications  
in a remote host computer based on the customer commands.

BACKGROUND OF THE INVENTION

15 The present invention provides a low cost, reliable solution to access public  
and private data over a data network, and furthermore, data behind corporate  
firewalls, securely from anywhere and at any time. Existing solutions are very  
expensive, proprietary and require expensive infrastructure and outside consulting  
support for systems integration.

## SUMMARY OF THE INVENTION

The present invention solves the above problem of providing low cost, reliable access to public and private data.

5 The present invention provides a remote service agent frame work that allows the execution of applications in a native host environment to access data resident inside a firewall or public data from the Internet or other data network. The invention uses the e-mail, SMS, ICQ, Instant Messenger (IM), etc., infrastructure to deliver remote commands. A server connected to the existing infrastructure executes the commands and delivers the requested data to the user.

10 Service requests can be sent by any e-mail, SMS, IM, etc., capable device, for example, from desktop e-mail, from a mobile phone, from a 2-way pager, from a PDA, etc.

15 According to the invention, a personalized environment is created based on the incoming e-mail or other address. This allows significant security and customization capabilities for each individual user or at the department or company level.

20 E-mail infrastructure is universally available. In the following, when e-mail infrastructure is referred to, it should be understood that other communication structures are also included, such as SMS, ICQ, and IM, without limitation. The invention uses the existing e-mail infrastructure as a transport mechanism and builds a solution on top of it. The present invention is designed with three main goals:

1. It provides an inexpensive frame work that allows data access at any time and from anywhere.
2. It allows services to be expanded (customizable) without any outside  
25 help (i.e., no need for expensive systems integration assistance).
3. It uses existing devices "as is" (or uses existing delivery infrastructure, i.e., PC's, wireless PDA's, e-mail enabled phones,

http, SMS, WAP and Instant Messaging capable devices (AOL, MSM, Yahoo, ICQ), etc. to send commands and receive data.

The present invention thus uses the existing e-mail infrastructure to send requests and receive data.

5           The present invention is a remote service agent that is particularly useful with wireless devices. The present invention uses the e-mail transport protocol mechanism to enable devices such as cell phones, two-way pagers and PDA's to send the service requests and access both private and public data in a secure manner. Because the present invention uses the existing e-mail infrastructure, it requires no  
10 additional hardware or expensive proprietary software to function, thereby reducing the cost of remote data access dramatically.

          The present invention is built on a frame work, which allows expansion of the system according to the user's personal or corporate requirements. New Services can be easily added and tagged as "public" or "private". "Public" services are available  
15 to everyone. "Private" services can be personalized to each individual/department/corporation and are designed for the registered users including individuals, system administrators, software developers and techno hobbyists.

          The present invention has the following features:

          It allows access to data that resides inside of a corporate firewall.

20           It allows access to data from a personal or corporate calendar or telephone book.

          It can retrieve corporate or personal e-mail while the user is on the road.

          It allows remote execution of native host commands and applications.

          There is no need for expensive hardware or specialized environments.

25           It works independently of existing information technology (IT) infrastructure, i.e., no need to disrupt or integrate with the existing systems, thus avoiding expensive integration costs.

It enables cell phones, two way pagers and PDA's with e-mail capability, to fetch both private and public data.

It extends the capabilities of pagers, PDA's and Blackberry devices with e-mail capabilities.

5 It acts as an agent to any wireless device with e-mail capability to perform tasks for the mobile users otherwise only possible if they are present at their desks.

It is customizable to individual requirements.

Other features and advantages of the present invention will become apparent from the following description of the invention which refers to the accompanying  
10 drawings.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1A is an overall system diagram of the environment of the invention;  
Figs. 1B, 2A and 2B are flowcharts of the system of the invention; and  
Fig. 3 is a block diagram of a service agent server in accordance with the  
15 invention.

#### DETAILED DESCRIPTION OF EMBODIMENTS OF THE INVENTION

The present invention builds on the fact that e-mail is a simple and common way of communication. The user registers with an entity that provides the service of the present invention. The system provides a standard or base package and a  
20 customizable package. Users may choose to use the standard services provided with the base package to fetch information such as, for example, stock quotes, directions, restaurants, cinemas etc. or elect customization of the services.

The user sends a command via e-mail to a server device agent that has the software of the present invention loaded thereon requesting certain information or  
25 perform a task (see examples below). The agent processes the request to fetch the

information, fetches the information by, e.g., linking to a source of the information and sends the information requested back via e-mail. It will send the information back on the same channel through which the request came, i.e., e-mail, IM, SMS, ICQ, etc. The whole process takes a short time, e.g., less than a minute. If the request is a task, the task is executed and the status is sent back to the user.

Users may also add custom services that suit their own needs. For example, system administrators can develop new services (i.e., either perl scripts or shell commands) to monitor the status of key servers. They will be able to remotely send requests to find out the status or health of the servers within their business. The system can be configured so that only authorized employees can use the new services.

Individual users may install a version of the invention which works as a standalone server and runs on the user's home machine where the user has the liberty to install various personal services that can be invoked remotely.

Corporations may install another version of the invention which works in conjunction with the corporation's e-mail server and can handle a much larger number of requests and provide a different set of services and different levels of security for multiple departments.

According to the invention, certain free services may be provided. The system can be designed so that a user does not need to register to use these services. The user sends an e-mail from his two-way pager, or cell phone or desktop. For example, the user sends e-mail to "I@infowiz.com", without any subject, and types "help" in the body of the e-mail message. The user will get back a list of services with examples:

To get help about the system:

"help" without any arguments will send back to the user a long document with many examples.

“help s” will send back to the user a shorter and concise version (about ½ page), which is particularly useful with mobile devices.

Other examples of free commands are follows:

To get stock quotes

5 q<symbol>+<symbol>+...  
q intc+ibm+msft

To find a business address, telephone number etc.

find <city> <state> <keyword>[+aux\_keyword]

10 find somerset nj bookstore  
find somerset nj cinema  
find somerset nj pizza  
find somerset nj pharmacy  
find somerset nj computer+store  
find somerset nj italian+restaurant  
15 find somerset nj burger+king  
find somerset nj taxi  
find somerset nj church

Some other keywords that the user can use are:

20 catering, grocery, mc+donald, burger+king, flower+shop, library, taxi, rental+car,  
shopping+mall, university, police, congressman, senator, mayor, synagogue, temple  
and many more.....

To find a person:

411 <last>+<first>+<city>+<state>  
411 clinton ++washington+DC

411 clinton +bill++DC

411 clinton +bill+washington+DC

To find driving directions:

dir "from\_street\_addr" city state "dest\_street\_addr" city state

5 dir "100 Davidson Ave" Somerset NJ "377 Hoes Lane" Piscataway NJ

To query for system's host name (nslookup):

ns<hostname>

ns www.softdomain.com

To perform a health check of a machine:

10 ping<hostname>

ping www.infowiz.com

ping 192.168.1.100

To track shipments:

15 fedex <tracking number>

ups <tracking number>

airborne <tracking number>

For weather:

20 w<city state>| <zip code>

w piscataway+nj

w santaclara+ca

w 08854

Further services can be made available for registered users who want to access data residing on machines inside a firewall, e.g., from a personal workstation or corporate databases. Both individual level security control and service level control should be provided. Also, registered users can customize all the free services listed above.

An example is a customized stock quotes command. User X always checks for prices on his favorite 6 stocks. Instead of typing all the six symbols every time, User X can instead build a customer service called "myq" which will be translated to "q ibm+hp+intc+msft+beas+crus". User X can thus send the service request as:

myq

The user can also get a reminder. For example:

rem <month><day><reminder message>

rem 11 15 "bday card to sister"

A user may fetch mail from a mail server inside a firewall. If sent without any arguments, all the pending mail will be forwarded to a pre-configured e-mail address. The user can also specify receiving only the e-mails received from certain individuals:

fetchmail

fetchmail [<from1><from2>... <from N>]

fetchmail bil @microsoft.com

To get a document from the user 's personal work station:

getdoc <file name>

getdoc mydata.doc

To convert a word/excel document and send the text back to the user:



doc2txt <filename>

xls2txt <filename>

doc2text mydata.doc

xls2txt salesdata.xls

- 5 To perform a system health check (for System Administrators):

sysstatus <host name>

systatus cosmos

To perform home control, mostly used with X-10 appliances):

homectl <device\_numer|device\_name><on|off>

- 10 homectl family\_lamp on

homectl garage on

The general command format of the system of the invention is:

command [parameters] [>to\_list] [<[EOF]

input\_data\_line1

- 15 input\_data\_line2

...

input\_data\_linen

[EOF]

Various examples of command line arguments:

- 20 A) Execute the command specified by command name and return the result to the user device which sent the command if user is not a registered one.

Otherwise, send the result to the email address in the user's environment.

command [arg1 arg2... argN]

- B) Execute the command but ignore the results i.e. don't send anything back.

Command [args] >

- C) Execute the command and send copy of the results to each email address after  
> sign. command >user1@comapny1.com...usrename@xyz.com
- D) Execute the command by passing the data that follows as input.

5           command [args]<EOF  
            input data line 1  
            input data line 2  
            ....  
            input data line N  
10           EOF

Fig. 1A is an overview of the system of the invention and its environment. The invention includes a server 15 (referred to sometimes as an infowiz server herein) server which is coupled to a digital network 10, for example, the Internet or other infrastructure for transmitting e-mail, SMS, ICQ, IM, etc. Various devices 12, for example, desktop computers, mobile phones, personal digital assistants (PDA's), pagers, etc. or any devices with e-mail capability are attached to the network 10. A mail server 14 is coupled to the network 10. The infowiz server 15 is coupled either inside a firewall, as shown, or outside a firewall, not shown. Any of devices 12 sends a command, for example, any of the commands listed as examples above, to a "COMMAND BOX" on the address for the server, in this case, identified as infowiz.com. This is identified by reference numeral 20 in Fig. 1B. The command is deposited in the COMMAND BOX of the mail server 14 as shown at 30. If the configuration is such that the mail server with the "COMMAND BOX" and infowiz server software are within the same network (i.e.: within the firewall), the mail server is pre-configured to hand over the in-coming request directly to the infowiz server, thus avoiding any delays.

However, if the mail server is outside the firewall and the InfoWIZ server is running inside the firewall, the InfoWIZ server periodically checks the COMMAND BOX for any incoming requests. Because the outside mail server that receives the commands cannot access the machines inside the firewalls, it is the responsibility of the InfoWIZ server 15 to probe the mail server for incoming requests. The probing interval is a user configurable parameter.

Fig. 2, comprising Figs. 2A and 2B, shows the steps of operation of the server having the software of the invention resident thereon. The incoming request is read by the server and the server first determines whether the user is registered at 70. If yes, the user's personal environment is set up. A determination is then made at 90 if the command is in a personal list of the user. If yes, the command is executed at 100. If the command is not in the personal list, a determination is made as to whether the command is in public list as indicated at 110. If yes, the command is executed at 100. If the command is not in the public list and it is not in the personal list, the command is saved in a deleted list and the incoming request is removed from the queue as indicated at 120.

If the user is not registered as determined at step 70, a determination is made as to whether the command is in the public list. If it is in the public list, a command is executed at 100. If not, it is saved in the deleted list and the request is removed from the queue at 120.

Assuming a command is executed at 100, a check is then made to determine if there are any errors. If yes, user specific messages are sent at 140. If no errors have occurred, the system obtains user specific output options at 150 and then delivers the requested data in the user specified format as indicated at 160.

Turning to Fig. 2B, the data is delivered based upon the type of output, i.e., HTTP, WAP or e-mail. If a customer request is fetched by means of a device having instant messenger capabilities, such as AOL, MSN or Yahoo, the inventive system

acts as a virtual user on the other end taking the customer request and executing it on the user's behalf in the native host environment and displays the output in the user's IM instantly. A determination is made, for e-mail, at 180, if the results are intended for a list of people. If yes, a copy of the results is sent to each e-mail address indicated at 190. It is not intended for a list of people, then the default destination address is obtained at 200 and the results are forwarded to the default address as indicated at 220.

Turning to FIG. 3, the infowiz server 15 is presented in a somewhat more detailed view and provides a simple way to retrieve information using the existing e-mail infrastructure. The user merely types in a customer command using, for example, an e-mail, an instant messenger (AOL, MSM, Yahoo, ICQ, etc), http or SMS as shown at 300. The server 15 having software executing thereon is capable of reading the customer command at 310 with subsequent parsing thereof at 320. The server 15 further has software for executing the customer command at 330 and at least one database 340. The database accessible by the server 15 stores a customized list of customer commands, a list of remote host computers, as well as public and private lists of services performed by the server 15. The server executes native host commands or applications in the remote host computers based on a customer command and sends data back to the user at 350 using the same channel of communication as the user originally used.

Thus, the present invention provides a simple way to retrieve information using existing e-mail infrastructure. The user types in a command request, as shown in the examples above, and the server, having software from the present invention resident thereon, will obtain the required information from sources coupled to the digital data network. The user can fetch mail from a mail server inside a corporate firewall as shown above or other private information behind a firewall, or publicly accessible information. The present invention thus provides a simplified, cost-

effective way to obtain information reliably and simply with any e-mail equipped device. The e-mail equipped device, with the appropriate command, accesses the server over the existing e-mail infrastructure which server then obtains the requested information and forwards it back to the e-mail equipped device over the existing e-mail infrastructure.

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Although the present invention has been described in relation to particular embodiments thereof, many other variations and modifications and other uses will become apparent to those skilled in the art. Therefore, the present invention should be limited not by the specific disclosure herein, but only by the appended claims.

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